Dear Sir / Madam;

We are pleased to inform you about the 2020 schedule for our popular training courses on measuring systems and TNC Controls.

HEIDENHAIN India is conducting these training courses at our state of the art Training Centre located at Chennai with a mix of theoretical and practical classes since our inception in 2008. These courses focus on two major branches, measuring systems and controls systems. The course on measuring systems spans 3 days while controls spans 4 days. The detailed course content is attached.

This programme has been very popular in the past with participants from major OEMs and end-users who use our products. The reviews have been excellent and most companies repeat nominations. The participants are either from service / maintenance functions or machine users.

The detailed schedule is given below. We look forward to your nominations!

TRAINING PROGRAMMES SCHEDULE FOR 2020

MEASURING SYSTEMS

MONTH	DATES
February	12-14
May	13-15
August	12-14
November	18-20

TNC CONTROLS

MONTH	DATES
March	10-13
April	7-10
June	9-12
July	14-17
September	15-18
October	13-16
December	15-18

Yours sincerely,
R.Geetha
Dy.Manager – Service & Training

Encl:
1. Terms & Conditions
2. Course content

Terms and conditions:

The training course will be conducted at our Chennai office, as below:

HEIDENHAIN OPTICS & ELECTRONICS INDIA PRIVATE LIMITED
Citilights Corporate Centre (Ground Floor)
No 1 Vivekananda Road, Off Mayor Ramanathan Road
Chetpet, Chennai 600031.
E mail : service@heidenhain.in ; Phone : 044-4023 4330 / 4023 4331

The contact person would be Mrs. R. Geetha and her e mail is Geetha@heidenhain.in

The course fee is payable in advance by cheque / DD / RTGS / NEFT, in favour of **Heidenhain Optics & Electronics India Pvt. Ltd.** payable at Chennai.

Course Fee:

- Measuring Systems : Rs. 10,000 + GST @ 18%
- TNC Controls : Rs. 15,000 + GST @ 18%

Account details:
State Bank of India
No. 110/1, Uthamar Gandhi Salai, Nungambakkam, Chennai, 600 034

Account Number : 3063 0198 308
IFS Code : SBIN0001176
MICR Code : 600002034

- The course duration will be **3 days for measuring systems** and **4 days for TNC controls.**
- For TNC training, participants are required to bring their own laptops
- Training Timings: 10.00 Hrs to 17:00 Hrs.
- The course fee includes course material, lunch, tea and excludes breakfast, accomodation, transport and any other incidental charges.

Please register for the course by sending your nominations, alongwith your payment to **Heidenhain Optics & Electronics India Pvt. Ltd.** Chennai. Only individuals, registered via Indian company nominations are eligible. Independent candidates are not accepted.

Please plan your training dates well in advance as seats are limited and are available on first come first served basis.**We reserve the right to cancel the training if sufficient participation requests are not received.**

Course content: HEIDENHAIN Measuring Systems (3 days)

- Introduction to Heidenhain products.
- Basics & Overview of Heidenhain measuring systems.
- Measuring principles of incremental linear encoders
- Mounting and electrical connections of incremental encoders
    - ❖ Practical applications
        1. Inspection of linear encoders
        2. Cleaning and repair options
        3. Replacing the sealing lips
        4. Replacing the scanning unit
        5. Setting the reference mark

- Description of Measuring Equipment Functions: PWM 21 and PWT 100.
- Testing, fault correction, maintenance and replacement of incremental linear encoders.
- Overview & Measuring principles of absolute encoders.
- Description of Adjusting and Testing Kit: PWM 21 and PWT 100.
    - ❖ Practical applications
        - o Cleaning, Testing and maintenance on absolute encoders

- Overview & Measuring principles of incremental & absolute Rotary / Angle / Magnetic / Inductive Encoders
- Mounting and electrical connections of Rotary / Angle Encoders.
- Accuracy of measuring units
- I P protection / DA 400 –Air compressor unit
- Operation safety
- Testing, maintenance on Rotary, Angle, Magnetic encoders with PWM 21 and PWT 100
    - ❖ Practical applications
        - o Cleaning, Testing and maintenance on Rotary / Angle encoders

- Overview , technical details and practical applications on
    1. Length gauges (MT, CT, ST, and ACANTO)
    2. Pulse shaping units (EXE, IBV, EIB)

- Introduction to encoders for testing & inspection of machine tools.
    - o VM /KGM / DBB

Course content : TNC Programming & General Maintenance Course (4 days)

- **Introduction to Heidenhain products.**

- **Preface to NC Programming**

  - Introduction on TNC Controls
  - Visual display unit and operating panel
  - Modes of operation
  - Status Display

- **Basic Skills**

  - File Management
  - Tool Table
  - Datum/Preset table

- **Path Functions**

  - Cartesian Coordinates
  - Polar Coordinates

- **Cycles**

  - Drilling cycles
  - Cycles for Milling Pockets, Studs and Slots
  - Cycle for Machining Hole Patterns
  - SL Cycles
  - Coordinate Transformation Cycles

- **Programming techniques**

  - Program Section Repeat
  - Sub programming
  - Nesting
  - Help, Tips and tricks

- **Preamble to advanced programming**

  - Fundamentals of FK
  - SmarT.NC

- **Basic Maintenance**

  - Hardware Overview
  - Information on HSCI technology
  - Accessories of the TNC Control
  - Principle of operation of the TNC Control
  - Wiring & Electrical Configuration
  - Connector designation and pin layout
  - NC Errors / Help
  - Diagnosis of NC faults
  - Log books and service files

- **Data Organisation**

  - Hard disk & File Management
  - Data storage medium (HDR,SSDR,CFR,USB)
  - NC software Update
  - Ethernet interface, Network setting/Data back-up
  - Code numbers / MOD functions
  - Machine Parameters

- **PC software**

  - TNC Remo NT
  - TNC Analyzer
  - TNC SCOPE
  - PLC Design NT

- **PLC Basics**

  - PLC Structure & PLC compilation
  - PLC Error messages
  - PLC Diagnosis through PLC Table, Trace etc.

- **Fault diagnosis of peripheral units**

  - Encoders
  - Hand wheel and touch probe
  - Visual display unit and keyboard